REMARKS

Claims 1-15 are currently pending. The specification has been amended for clarity reasons. Claims 1, 9-12 are amended by incorporating the features of cancelled claim 2. New claims 13-15 are added. No new matter has been added by the amendments or by the new claims.

The Objections to the Specification

The Office Action objected to the informalities contained on pages 1 and 3 regarding the expression "not higher than" preceding the temperature of 300 °C. *See*, Office Action at page 2.

Applicants have amended the specification at pages 1 and 3 to obviate the Examiner's concerns by replacing the phrase "not higher than" with "lower than" before the temperature of 300 °C. Accordingly, Applicants respectfully request withdrawal of this objection.

The Rejections under 35 U.S.C. § 102(b)

A. Claims 1, 3-5, and 7-12 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Iwaya *et al.* (U.S. 5,568,116). Applicants respectfully traverse the rejections for at least the following reasons.

With respect to claims 1, 3, 7, and 11-12, the Office Action asserts that Iwaya discloses ceramic compositions for thermistor with the general formula $(M^1_{1-x}N^1_x)(P^2_{1-y-z}N^2_yAl_z)O_3$, where M^1, N^1, P^2, and N^2 denote multiple elements, specifically: M^1=Y, N^1=Sr, P^2=Fe, and N^2=Mn (col. 2, lines 20-35), which would encompass a perovskite type oxide, garnet type oxide, and Sr-Al or Sr-Fe type oxide crystal phases. *See*, Office Action at pages 2-3. Moreover, regarding claims 4, 5, 8, 9 and 10, the Office Action asserts that Iwaya discloses the features of these dependent claims in various sections of Iwaya. *See*, Office Action at page 3.

In response, Applicants respectfully submit that Iwaya fails to anticipate all the elements of amended claim 1. Applicants have amended claim 1 by incorporating the features of

cancelled dependent claim 2, which was not rejected over Iwaya. In order for a reference to anticipate a claim, the reference must disclose, teach or suggest all elements of the claim. In this case, Iwaya fails to teach the recitation of amended claim 1, that is, $FeYO_3$ and/or $AlYO_3$ is selected as a perovskite type oxide and at least one compound selected from the group consisting of $Y_3Al_5O_{12}$, $Al_2Fe_3Y_3O_{12}$, and $Al_3Fe_3Y_3O_{12}$ is selected as a garnet type oxide, respectively by powder X-ray diffraction analysis. Iwaya, in contrast, teaches a ceramic composition with the formula $(M^1_{1-x}N^1_x)(P^2_{1-y-z}N^2_yAl_z)O_3$, where M^1, N^1, P^2, and N^2 denote multiple elements, which do not include the oxides with the designated formula recited in amended claim 1. More particularly, Iwaya's general formula does not encompass a perovskite type oxide with the formula $FeYO_3$ and/or $AlYO_3$ and it does not encompass a garnet type oxide with the formula $Y_3Al_5O_{12}$, $Al_2Fe_3Y_3O_{12}$, and $Al_3Fe_3Y_3O_{12}$. Accordingly, Iwaya fails to anticipate all the features recited in amended claim 1. Therefore, Applicants respectfully request withdrawal of this rejection.

Regarding dependent claims 3, 7, Applicants submit that since claim 1 is believed to be allowable over Iwaya, dependent claims 3 and 7, which depend from claim 1 are also believed to be allowable over Iwaya since these claims incorporate all the features of amended claim 1.

Regarding independent claims 11-12, Applicants have incorporated the features of cancelled claim 2. As amended, claims 11-12 are believed to be allowable over Iwaya for the reasons discussed above that Iwaya fails to teach the particular perovskite and garnet type oxides recited in cancelled claim 2. Accordingly, Applicants respectfully request withdrawal of this rejection as to dependent claims 3 and 7, and independent claims 11-12.

B. Claims 1-3, 5-7, 9, and 11-12 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Ogata *et al.* (U.S. 6,306,315). Applicants respectfully traverse the rejections for at least the following reasons.

With respect to claims 1-3, the Office Action asserts that Ogata discloses a thermistor portion of a thermistor device made of a mixed sintered body perovskite-type compound of formula $(M1M2)O_3$ composed of various compounds including Y, Sr, Mn, Al, and Fe (col. 4, ll. 28-35). *See*, Office Action at page 3. Further, the Office Action asserts that said thermistor portion (sintered body) is composed of a perovskite-type compound (col. 4, line 30), a garnet-type oxide (yttrium-aluminum-garnet, $Y_3Al_5O_{12}$) (col. 11, line 49) and Sr-Al or Sr-Fe (Col. 4, line 32 and 34). *See,* Office Action at page 4.

Moreover, with respect to claims 2 sand 6, the Office Action asserts that Ogata discloses a thermistor device made of a mixed sintered body perovskite-type compound of formula $(M1M2)O_3$, where M1 and M2 are selected from a group of elements, specifically, M1=Y and M_2=Fe and/or Al to give $FeYO_3$ and/or $AlYO_3$ (col. 4, ll. 28-35). Further, the Office Action asserts that Ogata also teaches using yttrium-aluminum-garnet (YAG), specifically $Y_3Al_5O_{12}$ (Col. 11, ll. 49-50). *See*, Office Action at page 4.

In response, Applicants respectfully submit that Ogata fails to teach all elements of amended claim 1, which incorporates the features of cancelled claim 2. In particular, Ogata fails to teach a sintered body for thermistor elements comprising garnet type oxide selected from the group consisting of $Y_3Al_5O_{12}$, $Al_2Fe_3Y_3O_{12}$, and $Al_3Fe_3Y_3O_{12}$ as recited in amended claim 1. Applicants respectfully point out that the passage cited by the Office Action at Col. 11, ll. 49-50 in Ogata refers to the yttrium-aluminum-garnet (YAG) that is part of the anti-reducing coating **14** as described in Figure 26, which is coated on the surface of the thermistor portion **13**. *See*, Ogata Figure 26 and col. 21, ll. 41-49. Thus, the anti reducing coating **14** formed by the YAG is not part of the thermistor portion **13** of the temperature sensor thermistor device as shown in Figures 2 and 26. *See*, Ogata Figure 2.

Moreover, the specification of Ogata distinguishes the thermistor portion **13** and the anti reducing coating **14** in several sections of the specification. For example, the specification states that:

> "FIG. 26 is an explanatory diagram showing the schematic cross-sectional constitution of the thermistor device 1 of this Embodiment. Thermistor device 1 consists of a thermistor portion 13 made up of thermistor materials formed in bulk of a specified shape and an anti-reducing coating 14 made of an anti-reducing material formed on the surface of this thermistor portion 13." Col. 21, ll. 42-48. (Emphasis added).

Further, the specification discusses the composition of thermistor portion **13** and the anti-reducing coating **14** in the following sections:

> "The thermistor portion **13** may be made of a mixed sintered body of $(M_1M_2)O_3Y_2O_3$ obtained by sintering a mixture of the aforementioned $(M_1M_2)O_3$ and Y_2O_3, or the thermistor portion 13 may be made of a mixed sintered body of $(M_1M_2)O_3$ Al_2O_3 obtained by sintering a mixture of the aforementioned $(M_1M_2)O_3$ and Al_2O_3." Col. 22, ll. 14-19.

> "On the other hand, the anti-reducing coating **14** should not allow oxygen to pass through and should be made of an anti-reducing material that has a resistance value higher than that of the thermistor material that makes up the thermistor portion **13** (namely the aforementioned mixed sintered body). The aforementioned **anti-reducing material** should preferably contain one or more elements selected from the group of Y, Al and Si. This composition is preferably a composition selected from the group of **Y_2O_3 (yttria), Al_2O_3 (alumina), SiO_2 (silica), $Y_3Al_5O_{12}$ (YAG), $3Al_2O_3.2SiO_2$ (mullite) and Y_2SiO_5."** Col. 22, ll. 20-30. (Emphasis added).

Thus, from reading the specification in Ogata, it is clear to one of skill in the art that the anti-reducing coating **14** in Figure 26 is evidently ***a coating*** protecting the thermistor element, which is ***not*** a component material of the thermistor element **13**. In contrast, the "sintered body for thermistor element" according to claim 1 is a "sintered body" functioning as the thermistor element, namely, a conductive "sintered body" having resistance value that varies depending on temperature changes. Therefore, the "sintered body for the thermistor element" of claim 1 actually corresponds to the "thermistor portion **13**" as described in the specification of Ogata. Ogata merely describes that perovskite-based materials are preferably used as the materials for the "thermistor portion **13**" (col. 21, line 49 to col. 22, line 19), and neither teaches nor suggests the use of a material having a garnet type oxide, specifically $Y_3Al_5O_{12}$, $Al_2Fe_3Y_3O_{12}$, and $Al_3Fe_3Y_3O_{12}$ as the ***actual material*** for the "thermistor portion **13**". Accordingly, Ogata does not teach all elements of amended claim 1.

Additionally, with respect to the assertion in the Office Action at page 4, lines 3-4 that Ogata teaches a thermistor portion (sintered body) composed of Sr-Al or Sr-Fe based oxide (col. 4, line 32 and 34), Applicants respectfully submit that Ogata merely lists elements contained in the perovskite-based compound constituting the thermistor element. However, Ogata does not state with specificity the inclusion of the Sr-Al based oxide and Sr-Fe based oxide along with the perovskite and garnet type oxides in the thermistor composition as recited in amended claim 1. Thus, Ogata does not teach or suggest the inclusion of another crystal phase aside from the perovskite-based compounds, let alone the inclusion of "at least one of Sr-Al and Sr-Fe based oxide" as recited in amended claim 1. Therefore, Ogata does not teach a thermistor portion comprising crystal phases of a perovskite type oxide, a garnet type oxide, and at least one of a Sr-Al based oxide and a Se-Fe based oxide as recited in claim 1. Accordingly, amended claim 1 is not anticipated by Iwaya or Ogata. Therefore, Applicants respectfully request withdrawal of this rejection over Ogata.

Regarding claims 3, 5-7, 9 and 11-12, Applicants submit that claims 3 and 5-7 depend from amended claim 1. Applicants believe that amended claim 1 is allowable over Ogata for the reasons discussed above, and, therefore, dependent claims 3 and 5-7 are also believed to be allowable over Ogata since these claims incorporate all the features of amended claim 1. Applicants have also incorporated the features of cancelled claim 2 into independent claims 9, 11, and 12. As amended claims 9 and 11-12 are believed to be allowable over Ogata for the same reasons discussed above, namely that Ogata fails to teach a thermistor portion comprising crystal phases of a perovskite type oxide, a garnet type oxide, and at least one of a Sr-Al based oxide and a Se-Fe based oxide as recited in claim 1. As discussed above, Ogata does not teach inclusion of the garnet type oxides, $Y_3Al_5O_{12}$, $Al_2Fe_3Y_3O_{12}$, and $Al_3Fe_3Y_3O_{12}$, in the thermistor composition. Accordingly, Applicants respectfully request withdrawal of this rejection as to claims 3, 7, and 11-12.

E. <u>New Claims 13-15</u>

New claims 13-15 have been added by this Amendment. New independent claim 13 recites the features of original claim 1 and dependent claim 4 with modified values for the mole number ranges of x, y, and z. New dependent claims 14-15 further recite the additional features of independent claim 13. Applicants submit that original claim 4 was not rejected under §102 (b) over Ogata. Accordingly, Applicants submit that Ogata does not anticipate claims 13-15 since Ogata does not teach all of the features of new claim 1, which incorporates claim 4 with the modified mole number values for x, y, and z.

However, the Office Action had rejected claim 4 as allegedly being anticipated by Iwaya. Applicants submit that Iwaya does not anticipate independent claim 13 for at least the reasons that Iwaya's composition does not satisfy the formula recited in independent claim 13, which has a modified range of x, y, z mole numbers different than that recited in original claim 4. For

example, the recitation of the formula in claim 13 can be presented below:

$(Y_{1-x}Sr_x)(Fe_{1-y-x}Mn_yAl_z)O_3$

$0.120 \leq x \leq 0.166$

$0.120 \leq y \leq 0.166$

$0.494 \leq z \leq 0.793$

$0.080 \leq 1\text{-}y\text{-}z$

Thus, from the above numerical description it follows logically that the upper limit of the expression **1-y-z** is **0.386** obtained simply from numerical substitution, *i.e.*, (1-0.120-0.494). Additionally, because **$0.120 \leq x \leq 0.166$; $0.494 \leq z \leq 0.793$ and $0.080 \leq 1\text{-}y\text{-}z \leq 0.386$**, the range of the expression "**x/1-y-z**" is **0.311-2.075** (lower limit; 0.120/0.386 and upper limit; 0.166/0.080) and the range of "**z/1-y-z**" is **1.280-9.913** (lower limit; 0.494/0.386 and upper limit 0.793/0.080).

In contrast, Iwaya discloses "**$0.001 \leq x/1\text{-}y\text{-}z < 0.20$** and "**$0 < z/(1\text{-}Y\text{-}z) \leq 0.90$**. *See*, Iwaya at col. 2, ll. 40-44. Accordingly, claims 13-15 recite "**x/1-y-z**" is **0.311-2.075** and "**z/1-y-z**" is **1.280-9.913**, whereas Iwaya teaches **x/1-y-z** in the range of **0.001 to 0.20 and z/1-y-z** in the range of **0 to 0.90.** *See*, Iwaya at page 2, ll. 38-43. Therefore, it is evident that the ranges recited in claim 13 ***do not*** overlap with the ranges described by Iwaya. Accordingly, Iwaya does not anticipate the subject matter of new claim 13.

In addition, Iwaya does not disclose a thermistor portion comprising crystal phases of a specific perovskite type oxide, a specific garnet type oxide, and *at least one of Sr-Al based oxide and an Sr-Fe based oxide* as recited in new claim 13. Iwaya merely provides a generic formula of a perovskite structure without delineating the particular crystal phases that can comprise the thermistor portion. Therefore, for all of the reasons discussed above, Iwaya and Ogata do not anticipate the subject matter of new claims 13-15 and are believed to be allowable.

F. Conclusion

In view of the foregoing, Applicants respectfully requests reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,
Morgan, Lewis & Bockius LLP

Laba Karki, Ph. D.
Registration No. 55,317

Dated: **February 12, 2009**
Morgan, Lewis & Bockius LLP
Customer No. **09629**
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
202-739-3000